

Claims

(Claims 1-18 canceled)

19. (Original) A method of mass producing insulating panels for covering windows and the like, each panel comprising a number of elongated tubular sections of flexible sheet material laminated together to provide a panel comprising many elongated aligned cells, each of the cells, when extending horizontally and in vertically-spaced expanded relation, being formed by top and bottom wall portions and front and rear wall portions connecting with front and rear margins of the upper and lower wall portions of each cell, the method comprising the steps of:

providing at least two continuous substrate sheets made of differently appearing materials;

securing at least one of the longitudinal margins of the two substrate sheets together to form a continuous multi-substrate sheet web and, where necessary, performing other steps, to form a continuous tubular web;

laminating longitudinally-spaced tubular segments of the web severed or to be severed therefrom to form tubular strips forming the laminated tubular sections of the panel when severed from the web, and severing the segments of the web to form the panel of laminated segments, wherein the front side of the completed panel is comprised only of one of the substrate sheets having the same appearance and the rear side of the panel is comprised only of the other of the substrate sheets having a different appearance.

20. (Original) The method of Claim 19, wherein only a pair of the continuous substrate sheets of the different appearing material are used to form the web, the substrate sheets being initially superimposed so that their opposite longitudinal edges are aligned, and the securing step secures together both of the opposite longitudinal edges of the superimposed substrata sheets together to form a flat closed tubular web, then expanding the flat tubular web and then flattening the same in a plane at a substantial angle to the plane of the original flat tubular web, so that the secured-together edges of the substrate sheets of each strip cut from the web will be located on one of the top or bottom wall portions of a tubular section of the panel when the various strips cut from the web are laminated together and the

panel formed thereby is oriented so that the tubular sections thereof extend longitudinally and in vertically-spaced relation.

21. (Original) The method of Claim 20, wherein the second plane is less than 90° from the original plane, so that when the flattening step is completed, the welds are laterally spaced on one of the top and bottom wall portions of each tubular section of the panel.

22. (Original) The method of Claim 21, wherein the tubular strips are adhesively laminated together over the welds to reinforce the same.

23. (Original) The method of Claim 21, wherein the step of flattening the tubular web in a plane less than 90° from that of the original plane of the tubular web includes the steps of transitioning the plane of the original web from an original horizontal plane to an upwardly extending plane and opening the tubular web and then flattening the web to form a horizontally flattened tubular web where the secured together edges are now located on opposite sides of a vertical plane passing through the center of the horizontally flattened web.

24. (Original) The method of Claim 19, wherein the securing of the longitudinal margins of the substrate sheets forming each strip is accomplished by superimposing and aligning the corresponding longitudinal margins of the continuous substrate sheets and welding together at least one aligned pair of the longitudinal margins of the superimposed sheets, and there is included the step of at least partially flattening any bulge which results from the welding step.

25. (Original) The method of Claim 24, wherein after flattening the welded—together edges of the tubular web, the web is passed in tension over a heated cambered plate, to minimize longitudinal bow in the tubular strip and ripples at the welded edges of the substrate sheets.

26. (Original) The method of Claim 19 wherein the laminated substrata sheets forming the tubular web which form the front and rear sides of the completed panel are made of material of different thicknesses wherein the web is oriented and flattened so that its secured together edge or edges of the tubular web are on the top or bottom of the flattened tubular web which is then fed and guided between at least one pair of pressure-applying nip rollers, one of the rollers being mounted for tilting adjustment in a vertical plane so that the

side of the roller to engage the thicker substrate sheet of the web applies a greater pressure to the web than the other side thereof, and so adjusting the tiltably mounted nip roller to apply the greater pressure to the thicker substrate sheet so the web is guided for movement in a straight line.

27. (Original) The method of Claim 25 wherein the laminated substrate sheet forming the tubular web which forms the front and rear sides of the completed panel are made of material of different thicknesses wherein the web is oriented and flattened so that its secured together edge or edges of the tubular web are on the top or bottom of the flattened tubular web which is then fed and guided between at least one pair of pressure-applying nip rollers positioned at both ends of the cambered plate, one of the nip rollers at each end of the plate being mounted for tilting adjustment in a vertical plane so that the side of the roller to engage one of the substrate sheets of the web applies a pressure which can be adjusted relative to the pressure applied by the other side of the roller which engages the other substrate sheet, and so adjusting the tiltably mounted nip roller to apply the desired pressures so that the web is guided for movement in a straight line.

28. (Original) In a method of mass producing insulating panels for covering windows and the like, each panel comprising a number of elongated tubular sections of flexible sheet material laminated together to provide a panel comprising many elongated aligned cells, each of the elongated cells, when extending horizontally and in vertically-spaced expanded relation, being formed by top and bottom wall portions and front and rear wall portions connecting with front and rear margins of the upper and lower wall portions of each cell, the method comprising the steps of:

providing at least two continuous substrate sheets made of differently appearing materials;

securing at least one of the longitudinal margins of the two continuous substrate sheets together to form a continuous multi-substrate sheet web and performing one or more other steps, if necessary, to orient the multi-substrate sheet web in a flat unfolded condition, where the substrate sheets of the web are in a common plane, then folding the longitudinal marginal portions of the web so that the confronting edges of the folded-over portions of the web do not overlap to form an

open tubular web which is then cut into strips and the strips laminated to form the panel.

29. (Original) The method of Claim 28, wherein there are only two continuous substrate sheets made of different appearing substrate materials which are secured together to form a two-substrate sheet web, the securing and other steps including superimposing the continuous substrate sheets so that at least one pair of their longitudinal edges are aligned, then welding the aligned longitudinal edges of the superimposed substrate sheets together to form a multi-substrate open—tubular web and then unfolding the open-tubular multi-substrate sheet web.

30. (Original) The method of Claim 29, wherein the welded portions of the unfolded web are flattened to produce a multi-substrate sheet web with a similar thickness throughout, then folding the outer longitudinal marginal portions of the multi-substrate web over the central portion of the multi-substrate web so that the confronting edges of the folded over portions of the web do not overlap to form an open tubular web which is then cut into strips and the strips laminated to form same panel.

31. (Original) The method of Claim 20, wherein the lamination of the tubular segments or strips includes the steps of applying longitudinally extending, laterally-spaced bands of adhesive to portions of the web which are to form one of the top and bottom wall portions of a tubular section of the panel when the tubular portions of the panel extend horizontally and are in vertically spaced relation, and pressing the adhesive-coated side of each of the segments of the web before or after severance therefrom against the side of the adjacent segment of the web which forms or is to form an adjacent tubular section of the panel.

(Claims 32-35 canceled)

36. (Original) The method of Claim 20 or 29, wherein the securing of the continuous substrate sheets together is carried out by welding of their longitudinal margins together with sonic welders comprising a vibrating member with presses the substrate sheets to be welded together against an anvil having a pointed profile, so that the substrate sheets being welded are severed at the location of the points on the profile of the anvil, producing a

separated, selvaged strip on the side of the pointed profile adjacent the margin of the substrate sheets and welds together confronting marginal portions at the superimposed surfaces of the substrate sheets on the opposite side of the pointed profile of the anvil.

37. (Original) The method of Claim 36, wherein there is provided the step of flattening the welds at the longitudinal margins of the three-substrate sheets before the segments of the web before or after they are severed from the web are laminated to the other segments thereof.

(Claims 38-60 canceled)

61. (Original) The method of Claim 60, wherein there is provided the step of flattening the welds at the longitudinal margins of the three-substrate sheets before the segments of the web before or after they are severed from the web are laminated to the other segments thereof.

62. (Original) A method for forming a cellular panel for a window covering, the method comprising the steps of:

forming a plurality of tubular cells, each consisting of a first sheet and a second sheet, and each having a pair of longitudinal margins;
laminating the plurality of tubular cells.

63. (Original) The method of Claim 62 wherein the step of forming the plurality of tubular cells includes:

positioning the longitudinal margins of the first sheet proximate the longitudinal margins of the second sheet joining the first sheet to the second sheet with an ultrasonic weld along their respective longitudinal margins.

64. (Original) The method of Claim 64 further including the step of reforming each tubular cell so that the welds are transitioned from the longitudinal margins to positions on top and bottom of a flat reformed cell.

65. (Original) The method of Claim 64 wherein the step of reforming each tubular cell includes laterally offsetting the weld of a first tubular cell from the weld of a second tubular cell.

66. (Original) The method of Claim 64 wherein the reforming of each tubular cell includes rotating the tubular cell, expanding the tubular cell, and flattening the tubular cell.

67. (Original) The method of Claim 66 wherein each tubular cell is rotated by passing it through spaced apart vertical rods.

68. (Original) The method of Claim 66 wherein the step of expanding each tubular cell includes passing the expanded tubular cell around an insert.

69. (Original) The method of Claim 68 wherein the insert includes a roller configured to keep each tubular cell expanded in a vertical plane and a guidance plate configured to keep the tubular cell expanded in a horizontal direction.

70. (Original) The method of Claim 69 further including the step of providing guidance members configured to keep the insert from shifting out of position.

71. (Original) The method of Claim 68 further including the step of passing the tubular cells between a pair of stationary grooved sleeves configured to laterally offset the welds.

72. (Original) The method of Claim 66 wherein the step of flattening each tubular cell includes vibrating the reformed cell against a rotating anvil having recessed portion configured to receive the welds.

73. (Original) The method of Claim 62 wherein the step of laminating the plurality of tubular cells includes applying an adhesive between adjacent tubular cells and successively stacking them.

74. (Original) The method of Claim 73 wherein the adhesive is applied to a top portion of a first tubular cell as a pair of spaced apart bands.

75. (Original) The method of Claim 74 wherein at least one of the spaced apart bands is applied over at least one of the welds.

76. (Original) The method of Claim 62 further including the step of passing the first and second sheets through a plurality of rollers configured to substantially maintain a constant tension in the first and second sheets.

77. (Original) The method of Claim 76 further including the step of moving at least some of the plurality of rollers with a feedback control system.

78. (Original) The method of Claim 77 wherein the plurality of rollers includes a photo-cell controlled edge guidance assembly.

79. (Original) The method of Claim 62 further including the step of slitting the first and second sheets along their longitudinal margins adjacent the welds.

80. (Original) The method of Claim 79 wherein the welds are formed by an anvil configured to weld the first and second sheets and slit the longitudinal edges.

81. (Original) The method of Claim 62 further including the step of relieving stresses produced in the reformed cell.

82. (Original) The method of Claim 62 further including the steps of cutting the web into a first strip and a second strip and positioning the first strip above the second strip.

83. (Original) The method of Claim 82 wherein the positioning includes raising the second strip to adhere to the bottom portion of the first strip.

84. (Original) A method for forming a cellular panel for a window covering, the method comprising the steps of:

providing a first sheet and a second sheet, each having a pair of longitudinal margins;

forming a first tubular cell by joining at least one longitudinal margin of the first sheet to at least one longitudinal margin of the second sheet;

adhering the first tubular cell to a second tubular cell.

85. (Original) The method of Claim 84, further including the step of reforming the first tubular cell by rotating the first tubular cell, expanding the first tubular cell, and flattening the first tubular cell.

86. (Original) The method of Claim 85 wherein the reforming step includes a step of laterally offsetting a first weld relative to a second weld.

87. (Original) The method of Claim 85 further including the step of passing the expanded first tubular cell around an insert prior to being flattened.

88. (Original) The method of Claim 87 further including the step of passing the first tubular cell between a pair of stationary grooved sleeves configured to laterally offset the welds.

89. (Original) The method of Claim 85 wherein the flattening the first tubular cell includes vibrating the reformed first tubular cell against a rotating anvil having recessed portion configured to receive the welds.

90. (Original) The method of Claim 84 wherein the adhering step includes applying a pair of spaced apart bands of adhesive.

91. (Original) A method for forming a cellular panel for a window covering, the method comprising the steps of:

providing a first sheet and a second sheet;

forming a tubular cell by joining the first sheet to the second sheet;

adhering a section of the tubular cell to a previously formed section of the tubular cell.

92. (Original) The method of Claim 91 wherein the first and second sheets each include longitudinal margins and wherein the first and second sheets are joined along their longitudinal margins.

93. (Original) The method of Claim 92 wherein the step of joining the first and second sheets includes providing ultrasonic welds along their respective longitudinal margins.

94. (Original) The method of Claim 91 wherein the first sheet is made of a first material, and the second sheet is made of a second material different than the first material.

95. (Original) The method of Claim 94 further including the step of reforming the tubular cell so that the welds are transitioned from the longitudinal edges to positions on top and bottom of a flat reformed web.

96. (Original) The method of Claim 95 wherein the step of reforming the tubular cell includes rotating the tubular cell, expanding the tubular cell, and flattening the tubular cell.